Title: Rate of Symptomatic Subscapularis Failure in Anatomic Total Shoulder Arthroplasty in Patients Greater than 70 Years of Age

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Background: One of the successes of anatomic total shoulder arthroplasty (TSA) survival rate is a well-functioning rotator cuff, but the subscapularis (SC) tendon and muscle are vulnerable to failure. Concerns regarding risk of subscapularis failure in older patients may shift surgeons towards performing reverse TSA for rotator cuff intact osteoarthritis. This study aimed to report the rate of clinically relevant failure after TSA in patients older than 70 years of age.

Materials & Methods: We retrospectively reviewed 282 patients greater than 70 years of age who underwent primary anatomic TSA for osteoarthritis at a single institution between 2017 and 2022 with a minimum of 1-year clinical or radiographic follow-up (mean 1.8 years). All patients were treated by two fellowship trained shoulder and elbow surgeons and utilized a lesser tuberosity osteotomy. Clinically relevant subscapularis failure was defined as either: (1) low ASES score less than the threshold score with a positive or equivocal belly press test, or (2) reoperation for clinically or radiographically diagnosed subscapularis deficiency. The threshold ASES score was defined as 80.7 based on the average of prior studies.[1,2] Demographic, radiographic, intraoperative, and postoperative variables were collected. Patients with failure were compared to those without failure using descriptive statistics.

Results: Of 282 patients, 23 patients (8.2%) demonstrated possible subscapularis failure by abnormal belly press testing or postoperative imaging, but only four patients (1.4%) were clinically symptomatic. Two patients met the failure criteria based on low ASES scores and abnormal belly press testing and two had confirmed subscapularis failure on ultrasound. Three of these patients (1.1%) underwent revision surgery for subscapularis deficiency. Three of the four were male, no cases used an augmented glenoid component, and one used an eccentric humeral head implant. Patients experiencing subscapularis failure had higher BMI (33.7 vs 28.7 kg/m²) and comorbidity burden (CCI 3.0 vs 0.49). They demonstrated inferior functional outcomes, with lower ASES scores (56.8 vs 90.4), and higher pain scores (VAS 4.76 vs 1.45) at most recent follow-up (mean 3.5 years, range 14 to 61 months). Anterior subluxation on postoperative radiographs was prevalent in 75% (3 of 4) of the failure group.

Discussion: Clinically apparent subscapularis failure after anatomic TSA is rare (1.4%) even in older patients. Older age should not represent a contraindication to TSA due to perceived risk of subscapularis failure. Incorporating functional scores and physical exam findings provides a more comprehensive definition of clinically meaningful failure.

References:

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Level of Evidence: III, Retrospective Cohort Study

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